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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,420	07/25/2003	Joel D. Stolfus	P03,0220 (H0005402)	2351
128	7590	11/29/2005	EXAMINER	
HONEYWELL INTERNATIONAL INC. 101 COLUMBIA ROAD P O BOX 2245 MORRISTOWN, NJ 07962-2245			SCHINDLER, DAVID M	
			ART UNIT	PAPER NUMBER
			2862	

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/627,420	Applicant(s) STOLFUS ET AL. 	
	Examiner David Schindler	Art Unit 2862	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.


#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

  
**Bot Ledynh**  
**Primary Examiner**

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. This action is in response to the communication received on 9/14/2005.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1 and 2 rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297).

As to Claim 1,

Behrens discloses a non-ferromagnetic compressor wheel of a turbocharger ((Page 6 Lines 12-13) and (Page 6, Lines 24-25) and (Page 7, Lines 10-11 / note: aluminum)), the non-ferromagnetic compressor wheel having fins ((6) / blades) (Figure 1), a permanent magnet (9) positioned so as to induce eddy currents on the fins ((Page 4, Lines 31-34) and (Page 7, Lines 31-35) and (Page 8, Lines 1-5)), and, at least

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one coil (10) positioned with respect to the non-ferromagnetic compressor wheel and the permanent magnet so as to be magnetically biased by the permanent magnet and so as to sense rotation of the non-ferromagnetic compressor wheel ((Page 4, Lines 31-34) and (Page 7, Lines 31-35) and (Page 8, Lines 1-5) and (Page 8, Lines 16-28) and (Figure 3)).

Behrens does not disclose replacing the coil with a magnetoresistor.

Nath discloses that a coil or a giant magnetoresistive sensor may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with a magnetoresistor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

As to Claim 2,

Behrens discloses the permanent magnet has a North-South axis, and wherein the North-South axis is pointed at the non-ferromagnetic compressor wheel (Figure 1).

5. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and in further view of Cila et al. (3,846,697).

As to Claim 3,

Behrens discloses a housing wall (2) near the non-ferromagnetic compressor wheel (Figure 1).

Behrens in view of Nath does not disclose the permanent magnet and the magnetoresistor are housed within a housing having external threads, and wherein the housing is threaded into a wall near the non-ferromagnetic compressor wheel.

Cila et al. discloses the permanent magnet (22) and the magnetoresistor (26) are housed within a housing (12) having external threads ((Figures 1-4) and (Column 2, Lines 35-48)), and wherein the housing is threaded into a connector (Column 2, Lines 22-26).

It would have been obvious at the time of the invention to modify Behrens in view of Nath to include the permanent magnet and the magnetoresistor are housed within a housing having external threads, and wherein the housing is threaded into a wall near the non-ferromagnetic compressor wheel given the above disclosure and teaching of Cila et al. in order to firmly attach the housing having external threads to the wall near the non-ferromagnetic compressor wheel.

As to Claim 4,

Behrens in view of Nath does not disclose the housing has a faceted portion arranged to receive a tool for turning the housing into the wall.

Cila et al. discloses the housing (12) has a faceted portion (hexagonally-shaped) ((Figure 1) and (Column 2, Lines 20-26)).

It would have been obvious at the time of the invention to modify Behrens in view of Nath to include the housing has a faceted portion arranged to receive a tool for turning the housing into the wall given the above disclosure and the teaching of Cila et al. in order to firmly secure the housing to the wall.

It is noted that Cila et al. does not explicitly disclose a tool for turning the housing into the wall, however, it would have been obvious to a person of ordinary skill in the art to use a tool, given the faceted portion of the housing disclosed in Cila et al., in order to ensure the housing was tightly and securely connected to the wall.

6. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and in further view of Takizawa et al. (6,894,484).

As to Claim 5,

Behrens discloses a housing wall (2) near the non-ferromagnetic compressor wheel (Figure 1).

Behrens in view of Nath does not disclose the permanent magnet and the magnetoresistor are housed within a housing having a screw receiving flange for fastening to a wall near the non-ferromagnetic compressor wheel.

Takizawa et al. discloses the permanent magnet ((28) and (Column 6, Line 47)) and the magnetoresistor ((27) and (Column 6, Lines 44-45)) are housed within a housing ((24) of sensor (20)) that is attached to housing (4) by screwing a flange formed in the base end portion of the sensor (20) to a mounting seat (Column 6, Lines 24-35).

It would have been obvious at the time of the invention to modify Behrens in view of Nath to include the permanent magnet and the magnetoresistor are housed within a housing having a screw receiving flange for fastening to a wall near the non-

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ferromagnetic compressor wheel given the above disclosure and the teaching of Takizawa et al. in order to firmly secure the housing having a screw receiving flange to the wall.

As to Claim 6,

Behrens in view of Nath does not disclose the permanent magnet abuts the magnetoresistor.

Takizawa et al. discloses the permanent magnet (28) abuts the magnetoresistor ((27) and (Column 6, Lines 44-45)) (Figure 2).

It would have been obvious at the time of the invention to modify Behrens in view of Nath to include the permanent magnet abuts the magnetoresistor as taught by Takizawa et al. in order to ensure that the magnetoresistor is properly biased by the permanent magnet.

As to Claim 7,

Behrens does not disclose the magnetoresistor is coupled to a comparator.

Nath discloses the magnetoresistor is coupled to a comparator ((Column 4, Lines 3-18) and (Column 4, Lines 28-55)).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include the magnetoresistor is coupled to a comparator as taught by Nath in order to determine the presence of a crack in the airfoil (Column 4, Lines 28-57).

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7. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and in further view of Stolfus (6,771,063).

As to Claim 8,

Behrens in view of Nath discloses as explained above.

Behrens discloses a coil produces pulses as the fins travel past the coil ((Figure 5) and (Page 8, Lines 9-20)).

Behrens does not disclose replacing the coil with a magnetoresistor.

Nath discloses that a coil or a giant magnetoresistive sensor may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with a magnetoresistor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

Behrens in view of Nath does not disclose the magnetoresistor is coupled to a pulse divider, and wherein the pulse divider divides the pulses produced by the magnetoresistor.

Stolfus discloses a sensor is coupled to a pulse divider, and wherein the pulse divider divides the pulses produced by the sensor ((Figure 5) and (Column 5, Lines 60-65)).

It would have been obvious at the time of the invention to modify Behrens in view of Nath to include the magnetoresistor is coupled to a pulse divider, and wherein the



pulse divider divides the pulses produced by the magnetoresistor given the above disclosure and teaching of Stolfus in order to improve the output of the sensor system (Abstract, Lines 1-10).

Given the above combination, by replacing the coil with the magnetoresistor, the magnetoresistor would produce pulses as the fins travel past the magnetoresistor and would be coupled to the pulse divider as the sensor in Behrens is the coil. Also note that each time a tooth passes the vehicle speed sensor mentioned in Stolfus (Abstract, Last 3 lines), a pulse will be generated.

As to Claim 9,

Behrens discloses the permanent magnet has a North-South axis, and where the North-South axis is pointed at the non-ferromagnetic compressor wheel (Figure 1).

8. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and Stolfus (6,771,063) and in further view of Cila et al. (3,846,697).

As to Claim 10,

Behrens discloses a housing wall (2) near the non-ferromagnetic compressor wheel (Figure 1).

Behrens in view of Nath and Stolfus does not disclose the permanent magnet

and the magnetoresistor are housed within a housing having external threads, and wherein the housing is threaded into a wall near the non-ferromagnetic compressor wheel.

Cila et al. discloses the permanent magnet (22) and the magnetoresistor (26) are housed within a housing (12) having external threads ((Figures 1-4) and (Column 2, Lines 35-48)), and wherein the housing is threaded into a connector (Column 2, Lines 22-26).

It would have been obvious at the time of the invention to modify Behrens in view of Nath and Stolfus to include the permanent magnet and the magnetoresistor are housed within a housing having external threads, and wherein the housing is threaded into a wall near the non-ferromagnetic compressor wheel given the above disclosure and teaching of Cila et al. in order to firmly attach the housing having external threads to the wall near the non-ferromagnetic compressor wheel.

As to Claim 11,

Behrens in view of Nath and Stolfus does not disclose the housing has a faceted portion arranged to receive a tool for turning the housing into the wall.

Cila et al. discloses the housing (12) has a faceted portion (hexagonally-shaped) ((Figure 1) and (Column 2, Lines 20-26)).

It would have been obvious at the time of the invention to modify Behrens in view of Nath and Stolfus to include the housing has a faceted portion arranged to receive a tool for turning the housing into the wall given the above disclosure and the teaching of Cila et al. in order to firmly secure the housing to the wall.

It is noted that Cila et al. does not explicitly disclose a tool for turning the housing into the wall, however, it would have been obvious to a person of ordinary skill in the art to use a tool, given the faceted portion of the housing disclosed in Cila et al., in order to ensure the housing was tightly and securely connected to the wall.

9. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and Stolfus (6,771,063) and in further view of Takizawa et al. (6,894,484).

As to Claim 12,

Behrens discloses a housing wall (2) near the non-ferromagnetic compressor wheel (Figure 1).

Behrens in view of Nath and Stolfus does not disclose the permanent magnet and the magnetoresistor are housed within a housing having a screw receiving flange for fastening to a wall near the non-ferromagnetic compressor wheel.

Takizawa et al. discloses the permanent magnet ((28) and (Column 6, Line 47)) and the magnetoresistor ((27) and (Column 6, Lines 44-45)) are housed within a housing ((24) of sensor (20)) that is attached to housing (4) by screwing a flange formed in the base end portion of the sensor (20) to a mounting seat (Column 6, Lines 24-35).

It would have been obvious at the time of the invention to modify Behrens in view of Nath and Stolfus to include the permanent magnet and the magnetoresistor are housed within a housing having a screw receiving flange for fastening to a wall near the

non-ferromagnetic compressor wheel given the above disclosure and the teaching of Takizawa et al. in order to firmly secure the housing having a screw receiving flange to the wall.

As to Claim 13,

Behrens in view of Nath and Stolfus does not disclose the permanent magnet abuts the magnetoresistor.

Takizawa et al. discloses the permanent magnet (28) abuts the magnetoresistor ((27) and (Column 6, Lines 44-45)) (Figure 2).

It would have been obvious at the time of the invention to modify Behrens in view of Nath and Stolfus to include the permanent magnet abuts the magnetoresistor as taught by Takizawa et al. in order to ensure that the magnetoresistor is properly biased by the permanent magnet.

10. Claims 14-18, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and in further view of Takizawa et al. (6,894,484).

As to Claim 14,

Behrens discloses a non-ferromagnetic compressor wheel of a turbocharger ((Page 6 Lines 12-13) and (Page 6, Lines 24-25) and (Page 7, Lines 10-11 / note: aluminum)), the non-ferromagnetic compressor wheel having fins ((6) / blades) (Figure 1), a permanent magnet (9) positioned so as to induce eddy currents on the fins ((Page

4, Lines 31-34) and (Page 7, Lines 31-35) and (Page 8, Lines 1-5)), and, a coil (10) (Page 6, Lines 13-17)) positioned with respect to the non-ferromagnetic compressor wheel and the permanent magnet so as to be magnetically biased by the permanent magnet and so as to sense a magnetic field induced by the eddy currents to thereby detect rotation of the non-ferromagnetic compressor wheel ((Page 4, Lines 31-34) and (Page 7, Lines 31-35) and (Page 8, Lines 1-5) and (Page 8, Lines 16-28) and (Figure 3)).

Behrens does not disclose replacing the coil with an active magnetic sensor, and a magnetic field sensor housing attached to a structure in proximity to the non-ferromagnetic compressor wheel, a permanent magnet disposed within the magnetic field sensor housing, and an active magnetic field sensor disposed within the magnetic field sensor housing.

Nath discloses that a coil or a giant magnetoresistive sensor (active magnetic sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with an active magnetic sensor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

Takizawa et al. discloses a magnetic field sensor housing (24) attached to a structure (4), a permanent magnet ((28) and (Column 6, Line 47)) disposed within the magnetic field sensor housing (Figure 2), and an active magnetic field sensor ((27) and (Column 6, Lines 44-45)) disposed within the magnetic field sensor housing (Figure 2).

It would have been obvious at the time of the invention to modify Behrens in view of Nath to include a magnetic field sensor housing attached to a structure in proximity to the non-ferromagnetic compressor wheel, a permanent magnet disposed within the magnetic field sensor housing, and an active magnetic field sensor disposed within the magnetic field sensor housing given the above disclosure and the teaching of Takizawa et al. in order to detect rotation (Column 6, Lines 41-42) and to prevent elements such as dirt from affecting the magnetic field sensor.

As to Claim 15,

Behrens discloses the permanent magnet has a North-South axis, and wherein the North-South axis is pointed at the non-ferromagnetic compressor wheel (Figure 1).

As to Claim 16,

Behrens discloses the permanent magnet abuts the coil (Figure 1).

Behrens does not disclose replacing the coil with an active magnetic sensor.

Nath discloses that a coil or a giant magnetoresistive sensor (active magnetic sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with an active magnetic sensor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

It is noted that given the above combination, the active magnetic sensor would abut the permanent magnet.

As to Claim 17,

Behrens discloses the permanent magnet has a North-South axis, and wherein the North-South axis is pointed at the non-ferromagnetic compressor wheel (Figure 1).

As to Claim 18,

Behrens does not disclose the active magnetic field sensor is coupled to a comparator.

Nath discloses the active magnetic field sensor is coupled to a comparator ((Column 4, Lines 3-18) and (Column 4, Lines 28-55)).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include the active magnetic field sensor is coupled to a comparator as taught by Nath in order to determine the presence of a crack in the airfoil (Column 4, Lines 28-57).

As to Claim 23,

Behrens discloses a coil as a magnetic field sensor (Page 8, Lines 1-5).

Behrens does not disclose replacing the coil with at least one giant magnetoresistive element.

Nath discloses that a coil or a giant magnetoresistive sensor (active magnetic sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with a giant magnetoresistive element given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

As to Claim 25,

Behrens discloses a coil as a magnetic field sensor (Page 8, Lines 1-5).

Behrens does not disclose replacing the coil with at least one Hall effect sensing element.

Nath discloses that a coil or a Hall element (active magnetic sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with a Hall effect sensing element given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

11. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and Takizawa et al. (6,894,484) and in further view of Adelerhof (6,559,638).

Behrens discloses a coil as a magnetic field sensor (Page 8, Lines 1-5).

Behrens in view of Nath and Takizawa et al. do not disclose the active magnetic field sensor includes at least one anisotropic magnetoresistive element.

Adelerhof discloses the active magnetic field sensor includes at least one anisotropic magnetoresistive element (Column 1, Lines 40-44 / note: AMR).

It would have been obvious at the time of the invention to modify Behrens in view of Nath and Takizawa to include replacing the coil with an anisotropic magnetoresistive



element given the above disclosure and teaching of Adelerhof in order to detect a magnetic field.

12. Claims 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and Takizawa et al. (6,894,484) and in further view of Stolfus (6,771,063).

As to Claim 19,

Behrens in view of Nath and Takizawa et al. discloses as explained above.

Behrens discloses a coil produces pulses as the fins travel past the coil ((Figure 5) and (Page 8, Lines 9-20)).

Behrens does not disclose replacing the coil with an active magnetic field sensor.

Nath discloses that a coil or a giant magnetoresistive sensor (active magnetic field sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with an active magnetic field sensor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

Behrens in view of Nath and Takizawa et al. does not disclose the magnetoresistor is coupled to a pulse divider, and wherein the pulse divider divides the pulses produced by the magnetoresistor.

Stolfus discloses a sensor is coupled to a pulse divider, and wherein the pulse divider divides the pulses produced by the sensor ((Figure 5) and (Column 5, Lines 60-65)).

It would have been obvious at the time of the invention to modify Behrens in view of Nath and Takizawa et al. to include the magnetoresistor is coupled to a pulse divider, and wherein the pulse divider divides the pulses produced by the magnetoresistor given the above disclosure and teaching of Stolfus in order to improve the output of the sensor system (Abstract, Lines 1-10).

Given the above combination, by replacing the coil with the magnetoresistor, the magnetoresistor would produce pulses as the fins travel past the magnetoresistor and would be coupled to the to the pulse divider as the sensor in Behrens is the coil. Also note that each time a tooth passes the vehicle speed sensor mentioned in Stolfus (Abstract, Last 3 lines), a pulse will be generated.

As to Claim 20,

Behrens discloses the permanent magnet has a North-South axis, and wherein the North-South axis is pointed at the non-ferromagnetic compressor wheel (Figure 1).

As to Claim 21,

Behrens discloses the permanent magnet abuts the coil (Figure 1).

Behrens does not disclose replacing the coil with an active magnetic sensor.

Nath discloses that a coil or a giant magnetoresistive sensor (active magnetic sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with an active magnetic sensor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

It is noted that given the above combination, the active magnetic sensor would abut the permanent magnet.

As to Claim 22,

Behrens discloses the permanent magnet has a North-South axis, and wherein the North-South axis is pointed at the non-ferromagnetic compressor wheel (Figure 1).

13. Claims 26-33, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and Stolfus (6,771,063).

As to Claim 26,

Behrens discloses inducing eddy currents in fins ((6) / blades) of the non-ferromagnetic compressor wheel ((Page 6, Lines 24-25) and (Page 7, Lines 10-11 / note: aluminum) and (Page 7, Lines 31-35) and (Page 8, Lines 1-5)), sensing a magnetic field induced by the eddy currents by use of coil ((10) and (Page 6, Lines 13-17) and (Page 8, Lines 1-5)), so as to produce pulses having a pulse rate dependent upon a speed at which the non-ferromagnetic compressor wheel rotates ((Page 8, Lines 16-28) and (Figure 3)).

Behrens does not disclose replacing the coil with an active magnetic

sensor, and reducing the pulse rate so as to provide a consistent pulse rate regardless of the number of the fins of the non-ferromagnetic compressor wheel.

Nath discloses that a coil or a giant magnetoresistive sensor (active magnetic sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with an active magnetic sensor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

Stolfus discloses reducing the pulse rate and having a substantially improved duty cycle which is independent of an associated sensor duty cycle ((Column 5, Lines 49-65) and (Abstract, Lines 1-10)).

It would have been obvious at the time of the invention to modify Behrens in view of Nath to include reducing the pulse rate so as to provide a consistent pulse rate regardless of the number of the fins of the non-ferromagnetic compressor wheel given the above disclosure and teaching of Stolfus in order to improve the output of the sensor system (Abstract, Lines 1-10) and to increase circuit versatility by enabling the circuit to function with any number of compressor wheels with different numbers of fins.

Please see the below Response to Arguments section regarding this claim.

As to Claim 27,

Behrens in view of Nath do not disclose the reducing of the pulse rate includes reducing the pulse rate by use of a divider.

Stolfus discloses the reducing of the pulse rate includes reducing the pulse rate by use of a divider ((Figure 5) and (Column 5, Lines 53-65)).

It would have been obvious at the time of the invention to modify Behrens in view of Nath to include the reducing of the pulse rate includes reducing the pulse rate by use of a divider as taught by Stolfus in order to improve the output of the sensor system (Abstract, Lines 1-10).

As to Claim 28,

Behrens discloses the inducing of eddy currents in fins of the non-ferromagnetic compressor wheel includes inducing eddy currents by use of a permanent magnet, wherein the permanent magnet has a North-South axis, and wherein the North-South axis is pointed at the non-ferromagnetic compressor wheel ((Figure 1) and Page 7, Lines 31-35) and (Page 8, Lines 1-5)).

As to Claim 29,

Behrens discloses the inducing of eddy currents in fins of the non-ferromagnetic compressor wheel includes inducing the eddy currents by use of a permanent magnet ((Figure 1) and Page 7, Lines 31-35) and (Page 8, Lines 1-5)), and the permanent magnetic abuts the coil.

Behrens does not disclose replacing the coil with an active magnetic sensor.

Nath discloses that a coil or a giant magnetoresistive sensor (active magnetic sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with an active magnetic sensor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

As to Claim 30,

Behrens discloses the permanent magnet has a North-South axis, and wherein the North-South axis is pointed at the non-ferromagnetic compressor wheel (Figure 1).

As to Claim 31,

Behrens discloses magnetically biasing the coil ((Figure 1) and Page 7, Lines 31-35) and (Page 8, Lines 1-5)).

Behrens does not disclose replacing the coil with an active magnetic sensor.

Nath discloses that a coil or a giant magnetoresistive sensor (active magnetic sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with an active magnetic sensor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

As to Claim 32,

Behrens discloses the inducing of eddy currents in fins of the non-ferromagnetic compressor wheel includes inducing the eddy currents by use of a permanent magnet ((Figure 1) and Page 7, Lines 31-35) and (Page 8, Lines 1-5)), wherein the magnetically biasing of the coil includes magnetically biasing the magnetic field by use of a

permanent magnet, and wherein the coil is biased and the eddy currents are induced by the same permanent magnet ((Figures 1 and 3) and Page 7, Lines 31-35) and (Page 8, Lines 1-5)).

Behrens does not disclose replacing the coil with an active magnetic sensor.

Nath discloses that a coil or a giant magnetoresistive sensor (active magnetic sensor) may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with an active magnetic sensor given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

As to Claim 33,

Behrens discloses a coil as a magnetic field sensor (Page 8, Lines 1-5)..

Behrens does not disclose replacing the coil with a giant magnetoresistive element.

Nath discloses that a coil or a giant magnetoresistive sensor may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with a giant magnetoresistive element given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

As to Claim 35,

Behrens discloses a coil as a magnetic field sensor (Page 8, Lines 1-5).

Behrens does not disclose replacing the coil with a Hall effect sensing element.

Nath discloses that a coil or a Hall element may be used to detect eddy currents (Column 4, Lines 3-18).

It would have been obvious to a person of ordinary skill in the art to modify Behrens to include replacing the coil with a Hall element given the above disclosure and teaching of Nath in order to detect the secondary magnetic fields generated by eddy currents (Column 4, Lines 11-13).

14. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and Stolfus (6,771,063) and in further view of Adelerhof (6,559,638).

Behrens discloses a coil as a magnetic field sensor (Page 8, Lines 1-5).

Behrens in view of Nath and Stolfus do not disclose the active magnetic field sensor includes at least one anisotropic magnetoresistive element.

Adelerhof discloses the active magnetic field sensor includes at least one anisotropic magnetoresistive element (Column 1, Lines 40-44 / note: AMR).

It would have been obvious at the time of the invention to modify Behrens in view of Nath and Stolfus to include replacing the coil with an anisotropic magnetoresistive element given the above disclosure and teaching of Aderehof in order to detect a magnetic field.



15. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens et al. (herein referred to as "Behrens") (DE 19623236 A1) in view of Nath et al. (herein referred to as "Nath") (6,707,297) and Stolfus (6,771,063) and in further view of Hartman et al. (2004/0118117).

Behrens in view of Nath and Stolfus do not disclose storing an actual maximum compressor sensed by the active magnetic field sensor.

Hartman et al. discloses compressor data for the maximum desired turbocharger speed stored in an engine control unit (ECU).

It would have been obvious to a person of ordinary skill in the art to modify Behrens in view of Nath and Stolfus to include storing an actual maximum compressor sensed by the active magnetic field sensor given the above disclosure and teaching of Hartman et al. in order to prevent the maximum desired turbocharger shaft speeds from being exceeded (Page 2, Paragraph [0022], Last 4 lines).

### ***Response to Arguments***

16. Applicant's arguments with respect to claim 1-25 have been considered but are moot in view of the new ground(s) of rejection.

17. Applicant's arguments filed 9/14/2005 have been fully considered but they are not persuasive.

With respect to Applicant's argument on page 18 of the Remarks, the Examiner

respectfully disagrees. Applicant argues that the Stolfus reference does not suggest reducing the pulse rate so as to produce a consistent pulse rate regardless of the number of fins of the non-ferromagnetic compressor wheel (Paragraph 2).

It is noted to Applicant that Stolfus discloses a divider circuit whose output is independent from the associated sensor duty cycle (Abstract, Lines 9-10). Stolfus further discloses that the circuit can be configured to provide a particular number of pulses (Column 3, Lines 45-47). Given the circuits independence from the output of the sensor duty cycle and that the circuit can be configured to provide a particular number of pulses, it appears that the circuit disclosed in Stolfus would be able to provide in the above combination of Claim 26, a consistent pulse rate regardless of the number of fins of the non-ferromagnetic compressor wheel.

It additionally noted to applicant that there is no apparent difference between the circuit disclosed in the above Stolfus reference and the one disclosed by Applicant. It is not clear how the two circuits differ. Due to the similarities, it appears that both circuits would be capable of performing the same functions, and thus the Stolfus reference would be capable of the same function as the circuit of Applicant's Figure 9.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Schindler whose telephone number is (571) 272-2112. The examiner can normally be reached on M-F (8:00 - 5:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
David Schindler  
Examiner  
Art Unit 2862

DS